

Claims

[c1] What is claimed is:

1. A telephone system having at least one extension, the telephone system comprising:
a central processing circuit for controlling the operation of the extension;
an audio processing circuit electrically connected to the central processing circuit, a speaker and a microphone for transmitting audio signals received by the microphone to the central processing unit; and
a network controller electrically connected to the central processing circuit and
a network port for transmitting network signals outputted from the central processing circuit to the network port and transmitting network signals received by the network port to the central processing circuit.

[c2]

2. The telephone system of claim 1 being a wireless digital key telephone system for processing the transmission of the audio signals and the network signals, the wireless digital key telephone system further comprising:
a central processing circuit for controlling the operation of the telephone exchange;
a memory device electrically connected to the central processing circuit for storing programs and data;
a network exchange module stored in the memory device for processing the transmission of the network signals between the telephone exchange and each extension;
an audio exchange module stored in the memory device for processing the transmission of the audio signals between the telephone exchange and each extension; and
a transceiver electrically connected to the central processing circuit for wirelessly transmitting and receiving the network and audio signals through an antenna;
wherein the network signals from the network port and the audio signals from the microphone received by the extension are transmitted through the transceiver to the transceiver of the telephone exchange, the network exchange module and the audio exchange module process the network and audio signals

then transmit the network and audio signals to the transceiver of other extensions through the network transceiver circuit in order to make the other extensions output the network and audio signals from the speaker and the network port.

- [c3] 3.The telephone system of claim 2 wherein the telephone exchange further comprises:
a network controller electrically connected to the central processing circuit; and
a network port for transmitting network signals outputted from the central processing circuit to the network port and transmitting network signals received by the network port to the central processing circuit.
- [c4] 4.The telephone system of claim 3 wherein the signal transmission in both the network controller of the telephone exchange and the network controller of the extension all meet the IEEE 802.3 communication protocol defined by IEEE (Institute of Electrical and Electronic Engineers, IEEE).
- [c5] 5. The telephone system of claim 3 wherein the network port of the telephone exchange and the network port of each extension are all of the media type, 10base-T.
- [c6] 6. The telephone system of claim 3 wherein the network controller of the telephone exchange and the network controller of the extension are all repeaters for relaying the network signals.
- [c7] 7. The telephone system of claim 2 wherein the telephone exchange further comprises an audio processing circuit electrically connected to the central processing circuit and a transmission port for transmitting the audio signals outputted from the central processing circuit to the transmission port or transmitting the audio signals received from the transmission port to the central processing circuit.
- [c8] 8.The telephone system of claim 7 wherein the telephone exchange comprises:
a Digital-to-Analog converter for transforming digital audio signals outputted from the central processing circuit into corresponding analog audio signals; and
an Analog-to-Digital converter for transforming analog audio signal received

from the transmission port into corresponding digital audio signals.

- [c9] 9. The telephone system of claim 2 wherein the transceiver of the telephone exchange and the transceiver of the extension meet the IEEE 802.11 communication protocol defined by IEEE.
- [c10] 10. The telephone system of claim 2 wherein the transceiver of the telephone exchange and the transceiver of the extension transmit audio and network signals by direct sequence spread spectrum (Direct Sequence Spread Spectrum, DSSS).
- [c11] 11. The telephone system of claim 2 wherein the transceiver of the telephone exchange and the transceiver of each extension transmit audio and network signals by code-division multiple access (Code-Division Multiple Access, CDMA).
- [c12] 12. The telephone system of claim 1 wherein the network port of each extension is electrically connected to a computer system.
- [c13] 13. The telephone system of claim 1 wherein the audio processing circuit of the extension comprises:
 - a Digital-to-Analog converter for transforming the digital audio signals outputted from the central processing unit to the corresponding analog audio signals; and
 - an Analog-to-Digital converter for transforming the analog audio signals received from the microphone to the corresponding digital audio signals.
- [c14] 14. A method of signal processing for a telephone system having at least one extension, the method comprising:
 - a central processing circuit for controlling the operation of the extension;
 - an audio processing circuit electrically connected to the central processing circuit and a speaker and a microphone; and
 - a network controller electrically connected to the central processing circuit and a network port;
 - the method of signal processing comprising:
 - transmitting the audio signals outputted from the central processing circuit to the speaker and transmitting the audio signals received from the microphone to

the central processing circuit; and
transmitting the network signals outputted from the central processing circuit
to the network port, and transmitting the network signals received from the
network port to the central processing circuit.

[c15]

15. The method of signal processing of claim 14 wherein the telephone system
is a wireless digital key telephone system for processing the transmission of
audio and network signals and the wireless digital key telephone system further
comprises a telephone exchange comprising:

a central processing circuit from controlling the operation of the telephone
exchange;

a memory device electrically connected to the central processing circuit for
storing programs and data;

a network exchange module stored in the memory device for processing the
transmission of the network signals between the telephone exchange and the
extension;

an audio exchange module stored in the memory device for processing the
transmission of the audio signals between the telephone exchange and the
extensions; and

a transceiver electrically connected to the central processing circuit for
wirelessly transmitting and receiving network and audio signals through an
antenna;

the extension further comprising:

a transceiver electrically connected to the central processing circuit for
wirelessly transmitting the network and audio signals to the antenna of the
telephone exchange and receiving the network and audio signals transmitted
from the antenna of the telephone exchange;

the method of signal processing further comprising:

the transceiver for transmitting the network signals received from the network
port and the audio signals received from the microphone to the telephone
exchange;

the transceiver for the network and audio exchange modules of the telephone
exchange processing the network and audio signals then transmitting the

network and audio signals from the transceiver to the transceivers of other extensions, and the other extensions outputting the network and audio signals from the speaker and network port respectively.

[c16] 16.The method of signal processing of claim 15 wherein the telephone exchange further comprises:
a network controlled electrically connected to the central processing circuit; and
a network port for transmitting the network signals outputted from the central processing circuit to the network port in order to transmit the network signals received from the network port to the central processing circuit.

[c17] 17.The method of signal processing of claim 16 wherein the signal transmission of the network controller of the telephone exchange and the network controller of each extension meet the IEEE 802.3 communication protocol defined by IEEE.

[c18] 18.The method of signal processing of claim 16 wherein the network port of the telephone exchange and the network port of the extension are all of the media type, 10base-T.

[c19] 19.The method of signal processing of claim 16 wherein the network controller of the telephone exchange and the network controller of the extension are all repeaters for relaying the network signals.

[c20] 20.The method of signal processing of claim 15 wherein the telephone exchange further comprises:
an audio processing circuit electrically connected to the central processing circuit; and
a transmission port for transmitting the audio signals outputted from the central processing circuit to the transmission port or transmitting the audio signals received from the transmission port to the central processing circuit.

[c21] 21.The method of signal processing of claim 20 wherein the audio processing circuit of the telephone exchange comprises:
a Digital-To-Analog converter for transforming the digital audio signals outputted from the central processing unit to the corresponding analog audio signals; and

an Analog-To-Digital converter for transforming the analog audio signals received from the microphone to the corresponding digital audio signals.

- [c22] 22.The method of signal processing of claim 15 wherein the transceiver of the telephone exchange and the transceiver of the extension meet the IEEE 802.11 communication protocol defined by IEEE.
- [c23] 23.The method of signal processing of claim 15 wherein the transceiver of the telephone exchange and the transceiver of the extension transmit audio and network signals by DSSS.
- [c24] 24.The method of signal processing of claim 15 wherein the transceiver of the telephone exchange and the transceiver of the extension transmitting audio and network signals by CDMA.
- [c25] 25.The method of signal processing of claim 14 wherein the network port of the extension is electrically connected to a computer system.
- [c26] 26.The method of signal processing of claim 14 wherein the audio processing circuit of the extension comprises:
a Digital-To-Analog converter for transforming the digital audio signals outputted from the central processing unit to the corresponding analog audio signals; and
an Analog-To-Digital converter for transforming the analog audio signals received from the microphone to the corresponding digital audio signals.